

Monitoring DC Current and Power

Communications engineers have always desired to have information on DC current flowing to specific loads. More recently, this desire has changed into a very important need due to reductions in engineering and maintenance personnel. Additionally, new court mandated methods for billing Co-Location users have been based upon actual power consumption. Monitoring DC current, plus providing threshold alarms, has become very important. Critical loads can be impacted as a result of overloading a distribution fuse. Proper monitoring can alert engineers of a pending problem and allow proactive action. PECO II has recognized this need for several years and has developed products and services to address it.

DC Current Monitoring

Historically, monitoring DC current has been through the use of a calibrated voltage drop “Shunt” and a DC voltmeter with a scale calibrated for the corresponding DC current range. Typically, these shunts have calibrated voltage drops of 25, 50 or 100 millivolts. The shunt is part of the active DC circuit and may be in either the Battery or Battery Return side, which requires that the meter or monitoring device must be electrically isolated.

Using meters to monitor the DC currents requires personnel to record the readings and either make decisions or send the information to the appropriate person. Monitoring systems, i.e. PECO II’s family of MACS™ (Monitor, Alarm & Control System), can monitor the shunts, store and process the information, generate alarms/alerts and forward the information automatically or upon request. New power systems typically have shunts equipped for any fuse or circuit breaker distribution circuit with a rating greater than 100 Amperes making the addition of DC Current monitoring relatively easy.

Advancements in DC Current Monitoring via “Shunts”

Existing, installed and active power systems may not have shunts provided for the circuits of interest. Adding a shunt to an active circuit has an element of risk associated and the circuit may not be designed to accommodate the shunt. PECO II has introduced a line of 5 millivolt shunts, which are physically smaller, mechanically stronger and allow the shunt to be mounted between the distribution fuse/circuit breaker and the distribution cables. Reading a 5 millivolt shunt requires a very sensitive and accurate monitor, which must be able to resolve voltages of 10 microvolts (one thousandth of a millivolt). PECO II has developed and is installing the NetMACS, which is capable of monitoring many transducers including 5 millivolt shunts.

Advancements in DC Current Monitoring via “Hall Effect Transducers”

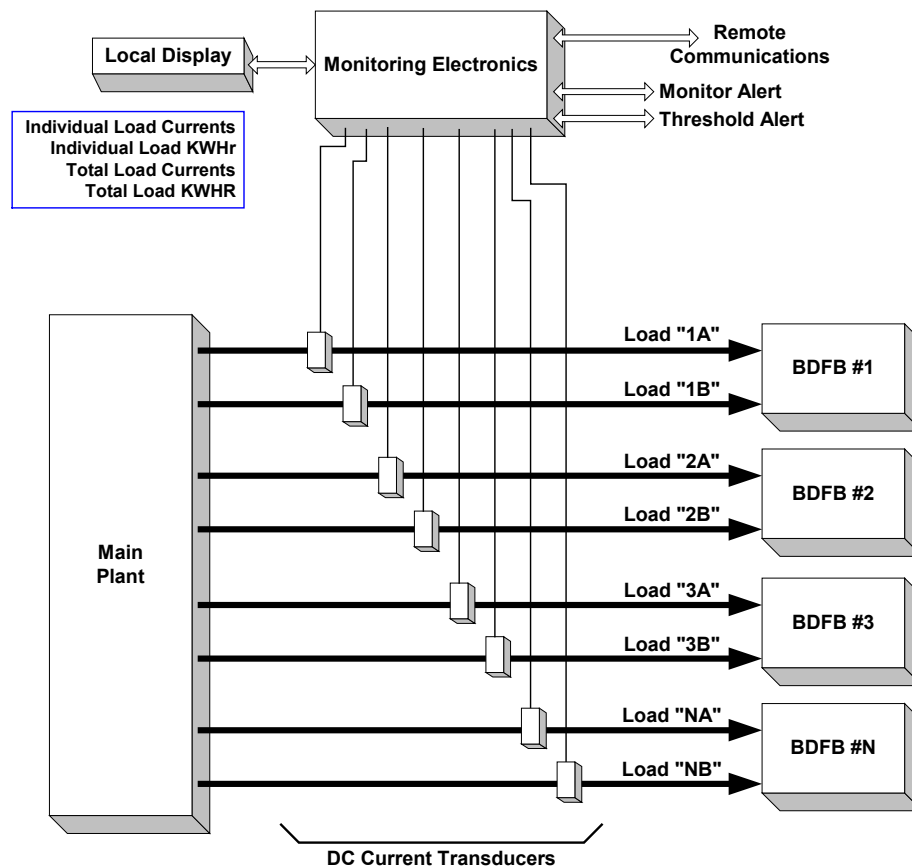
PECO II has also introduced a series of Hall Effect, Clamp-On, zero voltage drop DC current transducers that allow for fast, low risk installation upgrades for legacy systems. These devices are fully shunt compatible, electrically isolated and provide comparable accuracy. See figure 1 below:



Figure 1. PECO II's quick connect current sensors

Monitoring DC Currents to Secondary Distribution

Secondary distribution bays (BDFB's, PDU's etc.) are typically configured to provide multiple (20 to 24) secondary distribution (1 to 100 Ampere) circuits fed from a primary circuit rated at 200 to 600 Amperes. Overloading of a primary circuit resulting in the loss of that circuit and all associated secondary circuits is possible if DC current monitoring is not provided.



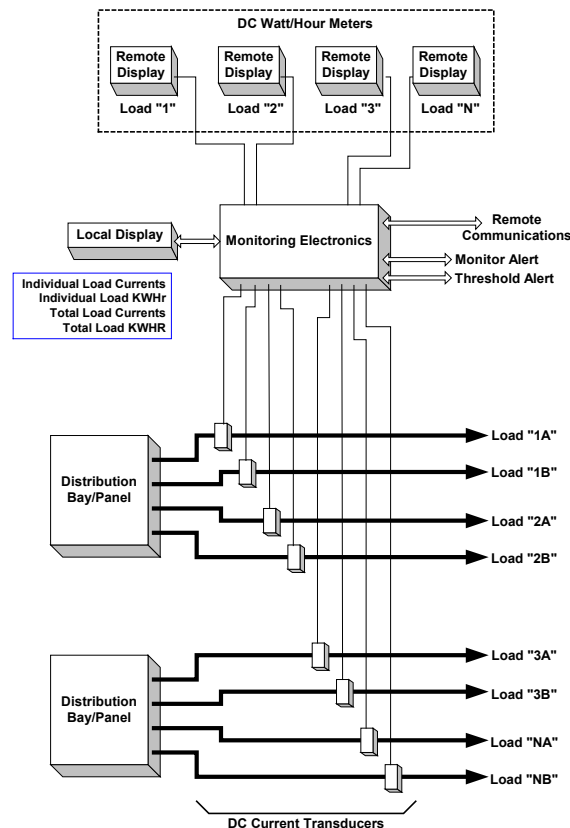
Example: Monitoring DC Currents - Primary (Main) to Secondary Distribution (BDFB)

Monitoring DC Power Consumption

Recent litigation has been resolved whereby some ILECs have agreed to provide power consumption based billing of DC power to their collocation CLEC customers. PECO II has products that can provide the required data. The NEBS certified NetMACS is one solution that can meter, store and forward Kilowatt/Hours based upon DC Power consumption (DC Voltage * DC Current * Σ time). The information can be displayed both locally and remotely via Web, Email, SNMP, and TL1 interfaces.

The second solution is PECO II's DC PowerMeter, available 2nd quarter 2004. It is a compact, cost effective, power monitor with local display and remote communications designed to collect, display and log many current and voltage parameters including:

- Currents
- Peak Currents
- Over Current Alarms
- Logs
- Voltages
- Kilowatt/Hours



Example: Monitoring DC Current & Power Consumption

Monitoring Solutions

PECO II provides full Monitoring solutions which include Hardware, plus Installation and site Monitoring Services. The complete capability to alert the user of pending problems and provide complete reports and records to appropriate technicians, engineers and managers.

Related Product Bulletins:

DC PowerMeter NetMACS II